

Appl. No. 09/308,314
Amdt. dated August 7, 2003
Reply to Office Action of May 8, 2003

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 25 and 31-34 are to be amended as set forth in the following listing of the claims.

Claims 2 and 13 were previously canceled.

1. (previously presented) A shield cleaning system, operating by spraying with washing fluid, for shields of an automobile, comprising:

71 a motor, and a washing arm movable over and at a distance from the shield by said motor, and a push rod interconnecting the motor with the washing arm for displacing the washing arm in a longitudinal direction of the push rod, the washing arm extending transversely of the direction of longitudinal displacement;

at least one fluidic washing nozzle arranged on the washing arm for spraying washing fluid onto the shield;

wherein the washing nozzle is movable by the washing arm over a region of the shield which is to be cleaned, wherein the washing nozzle has an outlet opening facing said shield, and the washing fluid is sprayable on at least portions of the shield immediately during movement of the washing arm from a basic position of the washing arm; and

wherein the fluidic washing nozzle has a washing fluid jet oscillating essentially transversely to the direction of movement of the washing arm, and a shape of the push rod corresponds to a contour of the shield.

Claim 2 (canceled)

3. (previously presented) The shield cleaning system as claimed in claim 1, wherein the washing arm (6) is of tubular form for receiving a washing fluid duct (8) leading to a plurality of washing fluid line (10).

Claim 4 (withdrawn) The shield cleaning system as claimed in claim 3, wherein the washing fluid duct (8)

has a tapering inner contour, as seen from the connection (9) of the washing fluid line (10).

5. (previously presented) The shield cleaning system as claimed in claim 3, wherein a nonreturn valve (11) is arranged in the washing fluid duct (8).

6. (previously presented) The shield cleaning system as claimed in claim 3, wherein a heating element comprising a resistance wire 15 is arranged in the washing fluid duct (8).

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7. (withdrawn) The shield cleaning system as claimed in claim 1, wherein the washing arm (6) is mounted pivotably about a pivot axis (7).

8. (withdrawn) The shield cleaning system as claimed in claim 1, wherein there are means (yokes 46, 47, 56) for adjusting the distance of the washing nozzle (50, 54) from the shield (49, 55) during the movement of the washing nozzle (50, 54).

9. (withdrawn) The shield cleaning system as claimed in claim 1, wherein the washing arm (48, 53)

has a yoke (46, 47, 56) mounted pivotably in a lateral region of the shield (49, 55) and at least partially surrounding the shield (49, 55) in the basic position.

10. (withdrawn) The shield cleaning system as claimed in claim 1, wherein the washing arm (48) has a yoke (46, 47) mounted on two opposite sides of the shield (49).

11. (withdrawn) The shield cleaning system as claimed in claim 1, wherein the washing arm (48) has two yokes (46, 47) running parallel and the washing nozzle (50) is mounted pivotably relative to each of the yokes (46, 47).

12. (withdrawn) The shield cleaning system as claimed in claim 1, wherein the washing nozzle (54) is inclined transversely to its direction of movement.

Claim 13 (canceled)

14. (previously presented) The shield cleaning system as claimed in claim 1, wherein, in the basic position, the washing nozzles (12-14, 38) are countersunk in a recess (5, 36) of an automobile component adjacent to the shield (2, 34).

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15. (original) The shield cleaning system as claimed in claim 14, wherein the washing arm (37) has a cover (45) closing the recess (36) in the basic position.

16. (previously presented) The shield cleaning system as claimed in claim 1, wherein the washing arm (6, 37, 48, 53) is injection molded plastic.

17. (previously presented) The shield cleaning system as claimed in claim 1, wherein a guide (41) of the push rod (39) or a mounting of the washing arm is in one piece with a housing (44) of the automobile lights (35).

18. (withdrawn) The shield cleaning system as claimed in claim 1, wherein the washing arm is designed as a component (60) shaped according to the contour of a body element (58) and is arranged so as to be movable out of said body element.

19. (withdrawn) The shield cleaning system as claimed in claim 18, wherein the body element (58) is a fender of an automobile.

20. (withdrawn) The shield cleaning system as claimed in claim 18, wherein the washing nozzle (63) is arranged on the top side of the component (60).

21. (withdrawn) The shield cleaning system as claimed in claim 18, wherein the washing nozzle (63) is arranged on the underside of the component (60).

22. (withdrawn) The shield cleaning system as claimed in claim 18, wherein the component (60) is formed as a washing nozzle (63).

23. (withdrawn) The shield cleaning system as claimed in claim 18, wherein the component (60) is pivotable about a joint (62) running transversely to the longitudinal axis of the automobile.

24. (withdrawn) The shield cleaning system as claimed in claim 18, wherein the component (60) is arranged so as to be movable out of the contour of the body element (58) in parallel by means of the motor (61).

25. (currently amended) A shield cleaning system, operating solely by spraying with washing fluid, for shields of an automobile, comprising

a motor,

a washing arm component (60) movable over and at a distance from the shield by said motor, and a washing nozzle arranged on the washing arm component for spraying washing fluid onto the shield, wherein the washing nozzle has an outlet opening facing said shield in and defining all spraying positions of the nozzle and that of the washing arm component immediately during movement of the washing arm component from a basic position, the movement retaining the washing arm component parallel to the basic position, and the washing nozzle ~~is~~ sprayable sprays fluid on at least portions of the shield concurrently with ~~immediately during all of~~ said movement of the washing arm component, and wherein

the motor (61) for moving the washing arm component (60) is a motor (61) driven by the washing fluid, wherein the washing nozzle (12-14, 25, 38, 50, 54, 63) is a fluidic nozzle with a washing fluid jet oscillating essentially transversely to the direction of movement of the washing arm (6, 37, 48, 53), the fluidic nozzle comprising a swirl chamber with return ducts to an inlet region of the swirl chamber to induce oscillation of an emerging fluid washing jet.

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26. (previously presented) The shield cleaning system as claimed in claim 1, wherein there is a control device (22) for conveying the washing fluid to the washing nozzles (24, 25) at the start and end of an intended time interval.

27. (previously presented) The shield cleaning system as claimed in claim 1, with a washing fluid pump for conveying washing fluid to a front shield of the automobile, wherein the washing fluid pump (23) selectively conveys washing fluid in two directions, the washing fluid being capable of being conveyed in one direction to the front shield and in the other direction to other shields (2, 34, 65) of automobile lights (3, 4, 35).

28. (previously presented) The shield cleaning system as claimed in claim 1, wherein distance of the nozzle from the shield changes during movement of the washing arm and the nozzle is closest to the shield at an edge of the shield.

29. (previously presented) The shield cleaning system as claimed in claim 25, wherein distance of the nozzle from the shield changes during movement of the washing arm component and the nozzle is closest to the shield at an edge of the shield.

30. (previously presented) The shield cleaning system as claimed in claim 3, wherein a heating element comprising a resistance wire 15, is arranged at the washing nozzles.

31. (currently amended) A shield cleaning system, operating by spraying with washing fluid, for shields of an automobile, comprising:

41 a motor, and a washing arm movable over and at a distance from the shield by said motor, and a push rod interconnecting the motor with the washing arm for displacing the washing arm in a longitudinal direction of the push rod,

at least one fluidic washing nozzle arranged on the washing arm for spraying washing fluid onto the shield;

wherein the washing nozzle is movable by the washing arm over a region of the shield which is to be cleaned, wherein the washing nozzle has an outlet opening facing said shield, and the washing fluid is ~~sprayable~~ sprayed on at least portions of the shield ~~immediately during~~ concurrently with movement of the washing arm from a basic position of the washing arm; and

wherein the fluidic washing nozzle has a washing fluid jet oscillating essentially transversely to the

direction of movement of the washing arm, and a shape of the push rod corresponds to a contour of the shield.

32. (currently amended) A shield cleaning system, operating solely by spraying with washing fluid, for shields of an automobile, comprising:

a motor, and a washing arm having a push rod, the washing arm being displaceable at a distance from the shield by said motor in longitudinal direction of the push rod,

4' a washing nozzle arranged on the washing arm for spraying washing fluid onto a part region of the shield,

wherein the washing nozzle consists of at least one fluidic nozzle with a washing fluid jet oscillating essentially transversally to the ~~longitudinal~~ displacement of the washing arm,

and the at least one fluidic nozzle ~~is arranged to sprays~~ washing fluid during ~~the~~ movement of the washing arm ~~from a basic position on~~.

33. (currently amended) A shield cleaning system for spraying washing fluid on a shield of a vehicle, comprising:

a motor, a nozzle assembly, and a nozzle carrier supporting the nozzle assembly, the carrier being displaceable at a distance from the shield by said motor,

means connecting with the motor for driving the carrier along a prescribed path along the shield from a basic position, said driving means maintaining an orientation of said carrier parallel to said basic position during movement of said carrier along said path.

wherein the nozzle assembly consists of at least one fluidic nozzle with a washing fluid jet oscillating essentially transversely to said path,

4' and the at least one fluidic nozzle sprays washing fluid concurrently with movement of the carrier along the path.

34. (withdrawn) A method of directing a fluid on a shield of a vehicle, the method being suitable for cleaning the shield, the method comprising steps of:

providing a nozzle for spraying the fluid on the shield;

establishing a path extending along at least a part of the shield and being spaced apart from the shield;

employing a motorized drive for carrying
the nozzle along the path from a basic position;

operating the nozzle as a fluidic nozzle
to emit an oscillatory jet of the fluid to provide a spray
pattern in a direction transverse to the path, the motorized
drive maintaining a constant orientation of the spray pattern
relative to the basic position; and

wherein a spraying of the fluidic on the
shield by the nozzle is accomplished concurrently with a carrying
of the nozzle along the path.